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The mid-term outcome of distal radius reconstruction for giant cell tumor: Comparison of uncemented three-dimensional printing prosthesis and osteoarticular allograft

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Objectives: To compare the surgical techniques, as well as clinical, radiographic and complications outcomes between uncemented three-dimensional printing prosthesis and osteoarticular allograft reconstruction for distal radius giant cell tumor.

Methods: Seven and twelve patients who underwent uncemented three-dimensional printing prosthesis (prosthesis group) and osteoarticular allograft (allograft group) reconstruction for distal radius giant cell tumor were evaluated at an average follow-up of 26.0 and 40.0 months respectively. Surgical techniques, clinical records, radiographs, and Mayo wrist score were evaluated.

Results: In the prosthesis and allograft groups, the average surgical time was 2.8h (2.5-3.0h) and 3.2h (2.7-3.4h), respectively; the length of resection was 9.1cm (7.5-11.5cm) and 8.9cm (8.0-11.0cm), respectively. In the allograft group, the host bone and allograft union rate was 100%, and the average time for the bone union was 9m (7-12m). Subchondral bone alterations and joint narrowing were detected in all cases. There were 3 patients suffered from associated pain (especially upon palmar flexion of the wrist). There was no allograft fracture. Both of these two groups, there was no infection, local recurrence, and metastasis. The average Mayo wrist score was 65 and 80 points in the prosthesis and allograft groups, respectively.

Conclusions: Compared with osteoarticular allograft reconstruction, uncemented three-dimensional printing prosthesis reconstruction requires higher preparation technology. However, prosthesis-related surgical technology is relatively simpler, the matching degree between the prosthesis and the distal wrist joint is closer to the anatomy, the postoperative function of prosthesis reconstruction is better, and there were no allograft-related complications when using a prosthesis.

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